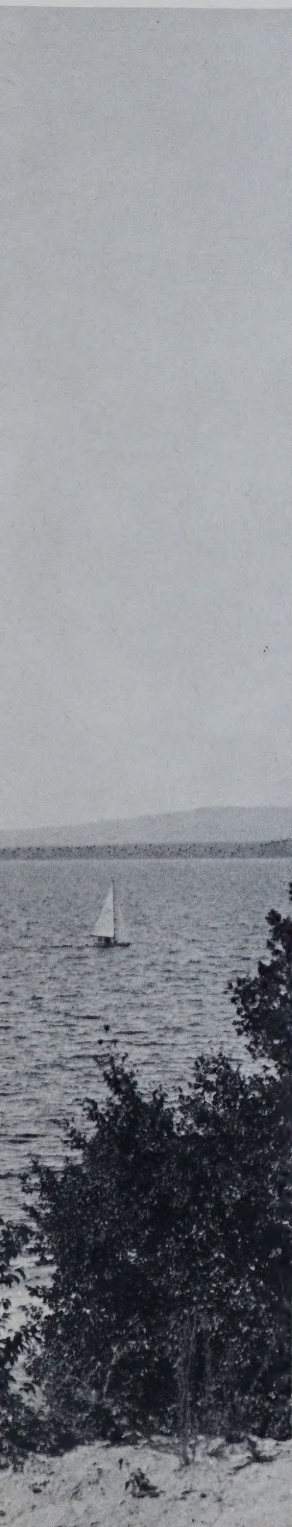
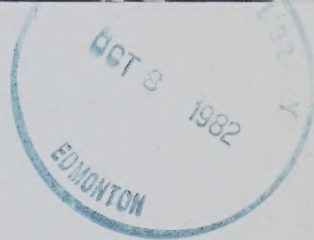
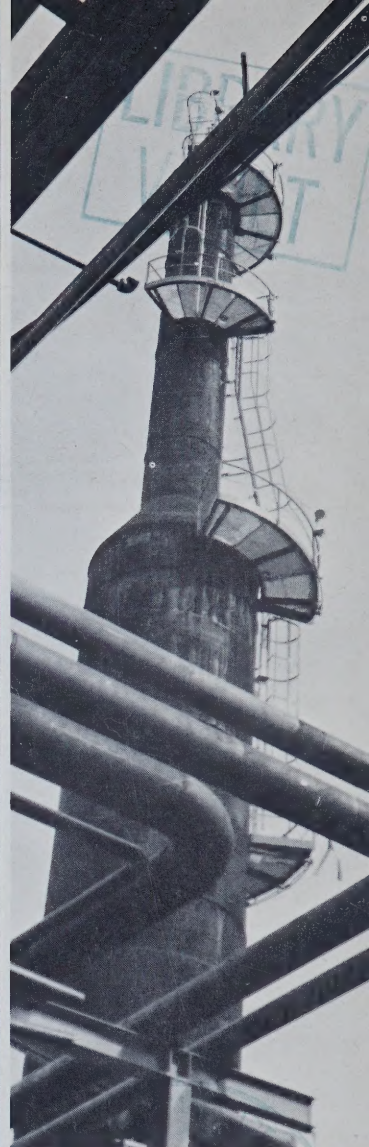


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alberta
department
of the
environment

HON. W. J. YURKO, MINISTER

DR. E. E. BALLANTYNE, DEPUTY MINISTER

COST-SHARING
ON WATER MANAGEMENT PROJECTS

WATER RESOURCES
DIVISION

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Edmonton, Alberta

October, 1972

COST-SHARING
ON WATER MANAGEMENT PROJECTS

Prepared by
Central Planning Group
WATER RESOURCES DIVISION
ALBERTA DEPARTMENT OF THE ENVIRONMENT

COST-SHARING
ON WATER MANAGEMENT PROJECTS



WATER RESOURCES DIVISION



MILNER BUILDING
10040 - 104 STREET
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FILE:
TELEPHONE (403) 425-1130
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To: The Honourable W.J. Yurko, P. Eng.,
Minister of the Environment,
Government of Alberta.

Sir:

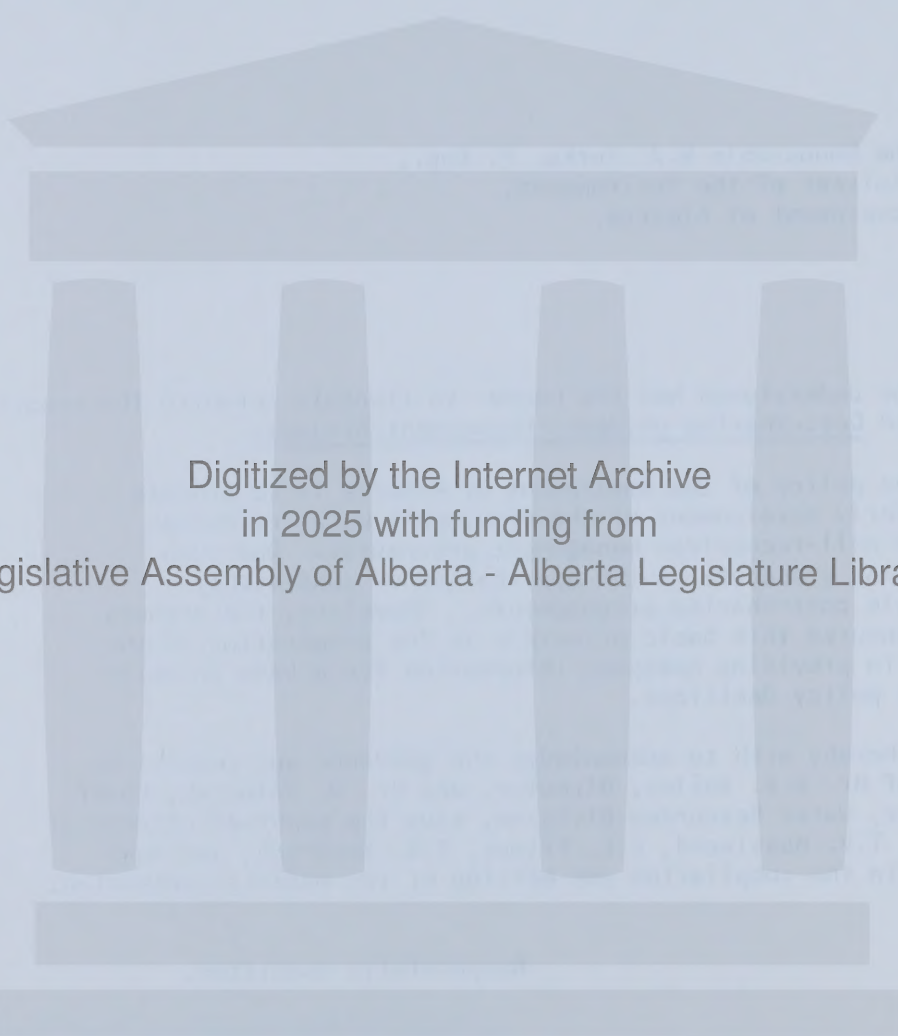
The undersigned has the honour to transmit herewith the report entitled Cost-Sharing on Water Management Projects.

The policy of the Government of Alberta is to promote the orderly development of the Province's water resources through well-recognized management procedures. One such management procedure is the application of consistent, equitable cost-sharing arrangements. Therefore, the authors have honoured this basic principle in the preparation of the report in providing adequate information for a base on which to make policy decisions.

I hereby wish to acknowledge the guidance and counsel to staff of Mr. R.E. Bailey, Director, and Mr. W. Solodzuk, Chief Engineer, Water Resources Division, plus the combined efforts of Messrs. T.V. Mussivand, C.L. Primus, S.W. Smotrych, and many others in the compilation and editing of the material presented.

Respectfully submitted,

E. E. Ballantyne, D.V.M., P.Ag., F.R.S.H.



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Dr. E.E. Ballantyne, D.V.M.
Deputy Minister of the Environment

Sir:

The undersigned has the honor to transmit herewith Report No. 3, entitled
Cost-Sharing on Water Management Projects.

This report is one of the series initiated following the two-day water
policy seminar held on December 8-9 1971, with the Honorable W.J. Yurko,
Minister of the Environment.

This seminar was significant in establishing guidelines for the development
of policies and priorities to foster intelligent management and use of the
water resources of Alberta.

This report contains background information and recommendations respecting
a possible cost-sharing arrangements for water projects designed to improve
the management and use of this resource.

I trust that the contents of this report may be found useful by members of
society and their elected representatives in determining programs of action
that will be in the best interest of the public of Alberta.

Respectfully submitted,

R.E. Bailey, P. Eng.
Director
Water Resources

TABLE OF CONTENTS

SYNOPSIS	i
ACKNOWLEDGEMENTS	ii
COST-SHARING ON WATER MANAGEMENT PROJECTS	1
Purpose of the Report	1
Scope of the Report	1
Special Characteristics of the Water Resource	2
Need for Cost-Sharing Arrangements	2
Considerations in Cost-Sharing	3
Types of Cost-Sharing Arrangements	4
Present Arrangements in the United States	5
Past and Present Arrangements in Alberta	7
Cost to be Shared	8
Types of Projects Considered for Cost-Sharing	9
Suggested Cost-Sharing Arrangements	14
Conditions for Cost-Sharing	18
CONCLUSIONS	19
RECOMMENDATIONS	20
APPENDIX A - OTHER SERVICES	21
General Inspection Services	21
Dissemination of Data	22
Flow Forecasting Service	23
Special Services	23
Services Related to Specific Programs	24
REFERENCES	25

SYNOPSIS

Cost-sharing arrangements provide a mechanism to distribute the costs of water management projects among those who benefit from the projects. To be equitable, any cost-sharing arrangements should conform to the principle that those who benefit should pay. A clearly defined cost-sharing arrangement, with specified criteria under which cost-sharing projects will be considered, will result in more equitable treatment for groups concerned with or involved in developing water management projects.

Of the several types of cost-sharing arrangements which have been used elsewhere, sharing costs on a certain percentage of project costs is recommended as the easiest to administer and as the most equitable to local groups.

ACKNOWLEDGEMENTS

This report is the result of the combined efforts of many individuals, particularly C. L. Primus who collected and arranged the basic information, and S. W. Smotrych who reviewed and commented on its presentation. The report was prepared under the direction of T. V. Mussivand and reviewed and edited by R. E. Bailey and W. Solodzuk.

LIST OF TABLES

No.

- | | | |
|----|---|----|
| 1. | Maximum U. S. Federal Percentage for Cost-Sharing | 6 |
| 2. | Maximum Government Percentage of Cost-Sharing | 7 |
| 3. | Summary of Cost-Sharing Arrangements | 17 |

COST-SHARING ON WATER MANAGEMENT PROJECTS

PURPOSE OF THE REPORT

The Water Resources seminar held on December 8-9, 1971 with the Minister of the Environment, the Honourable Mr. W. Yurko, resulted in suggestions for government policy in a number of major areas of water management. When formalized, the various policy statements will be presented as components of the Alberta Water Management Plan. One of the topics suggested for presentation was the development of an equitable cost-sharing arrangement for certain types of water management projects.

The Water Resources Division was directed to outline present cost-sharing arrangements relating to water resource projects and to suggest equitable cost-sharing techniques. This report presents a discussion on various cost-sharing arrangements used in Alberta and elsewhere, and suggests cost-sharing arrangements which could be applicable to water management projects which are of benefit to and in the interest of the general public.

SCOPE OF THE REPORT

The report deals with cost-sharing arrangements for the following types of projects:

1. Sources of water supply to municipalities
2. Flood control
3. River training
4. Water-based recreation
5. Fish and waterfowl habitat enhancement
6. Major onstream works and related structures for river basin management
7. Municipal sewage works.

SPECIAL CHARACTERISTICS OF THE WATER RESOURCE

Several characteristics of water have resulted in its being managed as a special public resource. These characteristics include:

1. The mobility of the resource. Actions by upstream or adjacent users may adversely affect other users with equal rights of access to the resource. Public management of water recognizes this interaction of users by imposing regulatory controls on water users.
2. The uneven distribution of water in some areas. Where water is scarce, monopoly control of this resource by the private sector could threaten public priorities.
3. The critical nature of the resource for maintenance of life.

For such reasons, it is desirable for governments to maintain public control of the water resource.

NEED FOR COST-SHARING ARRANGEMENTS

Public benefit from water resource management has resulted in some degree of government funding of water resource projects. Where benefits from such projects accrue to the general public, government involvement is clearly justified. However, benefits from water management projects do not always accrue exclusively to the public at large. In the majority of such projects, benefits accrue to individuals, private firms, local authorities, or limited segments of the public. In many instances very limited benefits accrue to the general public. If all costs were borne by government, development would be restricted due to limitations of funds and local participation in management and development decisions would be considerably less

effective. Also, public funds would in some instances be used to subsidize local beneficiaries. In keeping with the principle that those who benefit should pay, a mechanism to distribute project costs in an equitable manner is required. A cost-sharing arrangement is one method of distributing such costs.

If government, which includes all provincial and federal departments and agencies, is to contribute funds to water management projects where benefits do accrue to the general public, then a policy under which costs would be shared should be articulated. A clearly defined cost-sharing arrangement with specified criteria under which cost-sharing on projects can be considered would result in equitable treatment for those concerned with or involved in developing water management projects.

CONSIDERATIONS IN COST-SHARING

Cost-sharing arrangements must take into account several considerations, including:

1. The degree of public interest in the resource development.
The greater the degree of public interest, or the more widely benefits are dispersed, the greater is the responsibility of the public to bear a larger share of project costs.
2. Equity, or income redistribution effects. Cost-sharing arrangements should not be repressive; that is, contributions should to some extent be based on ability to pay. Also, windfall gains should not accrue to the private sector as the result of public expenditures.
3. Efficiency of resource use. Management policies must encourage efficient use of scarce resources.

4. Social objectives other than resource development.

Public funds available for investment are inadequate to meet all demands or objectives. Investment of public funds must be allocated according to priorities, which may result in certain desirable water resource management projects being deferred or rejected.

5. Problems inherent in developing consistent cost-sharing policies. Considerations such as equity, efficiency, and social objectives impose problems in developing an understandable, consistent cost-sharing arrangement. Ad hoc arrangements which require special agreements for each project result in inconsistent treatment of local beneficiaries. No one single arrangement can be expected to optimize all considerations.

TYPES OF COST-SHARING ARRANGEMENTS

Several cost-sharing methods have been utilized, each of which takes into account some of the above listed considerations with varying degrees of success. Four basic approaches which have been used are:

1. Costs are shared on the basis that each participant is responsible for specific types of costs; for example, the local group would be responsible for all land and right-of-way costs, while the senior government would be responsible for all capital costs.
2. Costs are shared on the basis of benefits received by each participant; for example, if a local group received 50% of the benefits assigned to water supply, then 50% of the costs of the project allocated to water supply would be allocated to that same local group. This method

requires that project costs be allocated for each project purpose, which is in itself a cumbersome problem.

3. Costs are shared on a fixed percentage for each purpose, and are paid proportional to the benefits received for each purpose; for example, if all recreation benefits accrued to a local group, and recreation required a 75% local contribution, that local group would contribute 75% of the estimated value of recreation benefits to the cost of the project. This method requires that project benefits be calculated in considerable detail. Also, the percentage contribution for each use would have to be established.
4. Costs are shared based on a certain percentage of project cost; for example, a local group must contribute a given percentage of project cost, regardless of benefits received. Fixed percentage contributions could be different for each purpose of a multiple-purpose project; this approach would require project costs to be allocated to each purpose. The alternative would be to set a percentage contribution for all purposes.

PRESENT ARRANGEMENTS IN THE UNITED STATES

A wide variety of cost-sharing arrangements have developed as the result of government involvement in water resource management.

To illustrate the variety of arrangements, the policies of three American water development agencies, the Bureau of Reclamation, the Soil Conservation Service, and the Army Corps of Engineers are summarized in Table No. 1.

TABLE NO. 1
MAXIMUM U.S. FEDERAL PERCENTAGE FOR COST-SHARING

Purpose	No. of the Three Federal Agencies Participating	Range of Percentage Costs			
		Capital Costs	Land Rights	Replacement Operation & Maintenance	Relocation & Alteration of Utilities
Flood Protection	3	100	0-100	0-100	0-100
Municipal & Industrial Water Supply	3	0	0	0	0
Irrigation	3	variable	0	0	0
Water Quality	2	0-100	0-100	0-100	0-100
Recreation: Fish & Wildlife Enhancement	3	50-100	0-50	0-50	-
Drainage	2	50	0-50	0-50	0
Hydroelectric Power	2	0	0	0	0
Navigation	2	50-100	0	0	0-100

Source: Federal Cost-Sharing Policies for Water Resources, U.S. Department of Commerce.

The cost-sharing arrangements outlined in Table No. 1 indicate only federal contributions. Federal agencies may cost-share with state governments or state organizations, thereby raising the total government contribution.

In summary, the American experience indicates that the three federal agencies have developed different cost-sharing arrangements for similar projects.

PAST AND PRESENT ARRANGEMENTS IN ALBERTA

The provincial government, through the Water Resources Division, has negotiated cost-sharing arrangements with various local groups. A summary of maximum government percentages of cost-sharing, both past and present, is contained in Table No. 2.

TABLE NO. 2
MAXIMUM GOVERNMENT PERCENTAGE OF COST-SHARING

Purpose	Range of Percentage Costs			
	Investigation and Design	Land or Right-of-Way	Capital Costs	Operation & Maintenance
Flood Control and Drainage				
--Past	100	0	50; 75	0
--Present	100	0	50	0
Conservation Waterfowl				
--Past	variable	0	50	0
--Present	100	0	variable depending on benefits	variable
Fisheries				
--Past	100	0	75	0
--Present	100	0	75	0
Water Supply	No consistent program			
Irrigation	Policy varied with time			

To date, no consistent cost-sharing policy covering all types of water resource projects has been adopted.

COSTS TO BE SHARED

If cost-sharing arrangements are to be implemented, a clear understanding of which costs are to be shared is mandatory. The purpose of this section is to outline the nature of costs incurred and to indicate at what point the costs will be shareable.

A request for a solution of a water problem, or for a project to develop and utilize the water resource, must be submitted to the Water Resources Division, Alberta Department of the Environment by a local authority. A "local authority" means:

- (a) a city, town, new town, village, municipal district or county, or
- (b) the Minister of Municipal Affairs, in the case of an improvement district or special area, or
- (c) the board of directors of an irrigation district, or
- (d) the board of trustees of a drainage district.

If the problem or proposal falls within the provisions of a cost-sharing program as herein defined, preliminary engineering analysis and project alternatives will be submitted to the local authority making the request. Once a proposal has been accepted, the project may be funded and implemented under a cost-sharing program, subject to government budgetary priorities.

Using this basic procedure, responsibility for costs will be:

- 1). Costs involved in the initial assessment of a problem, including preliminary problem analysis, preliminary design of a feasible alternative, and preliminary cost estimates may be borne by the government, or may be cost-shared depending on the nature of the project as indicated later in this submission.

2). As soon as a local authority accepts in principle the preliminary concept and cost estimates, project costs become shareable. These costs include:

- (a). Detailed engineering analysis, design and pre-construction preparation costs.
- (b). Implementation costs, including costs of construction and implementation supervision.

Once a project is accepted in principle by the local authority, all costs excepting acquisition of land are shared, even if technical or financial problems arise which prevent implementation of the project. The purchase of necessary land and right-of-way shall not be a shareable cost, but shall be undertaken and paid for entirely by the local authority requesting the project.

Upon completion, a project is licensed to the local authority initiating the project. The licensee assumes all responsibility for future maintenance and operation of the project, and accepts the condition that the provincial government will maintain an inspection service of all projects. When, in the judgement of the government, maintenance procedures are required to protect the investment made in the project, the local authority can be directed to undertake the necessary works.

TYPES OF PROJECTS CONSIDERED FOR COST-SHARING

Water resource projects cover a wide range of purposes including water supply, water control to reduce damages to property, and water management to enhance the quality of life.

Specifically, the following types of projects will be considered for cost-sharing:

1. Sources of water supply to municipalities.

Water supply projects may have several components, such as works to secure a supply either from surface or ground sources, works to transport the water from the source to the point of use, treatment facilities, and works to distribute the water to the user.

Cost-sharing on water supply projects will deal with only one component of water supply systems: costs associated with developing a supply source, either from surface or ground supplies. The other components of a water supply system, transportation, treatment and distribution will qualify for funding assistance under other government programs.

Municipal uses of water include residential, commercial, industrial, institutional, and public use. Municipal water supply projects as a whole provide services to a large segment of the citizens in Alberta. Accordingly, benefits from such projects are available to the general public. Government therefore has a direct concern in providing municipal water supplies and should cost-share in their development.

2. Flood control and flow regulation.

Flood control provides a measure of protection to life and property from:

- (a) over-bank flows from rivers and streams
- (b) high water conditions on lakes
- (c) temporary ponding resulting from excessive precipitation

Flood control projects may consist of works to control the rates of discharge in rivers or streams or to regulate water levels on lakes, works to prevent flood waters from encroaching on certain areas, works to remove excess water, land management schemes to control development on flood prone areas, or any combination of the above.

River channels are basically unstable entities, tending to shift position within their floodplains with varying degrees of consistency and rapidity. Existing floodplains may disappear as a result of erosive forces of the river or may be periodically inundated by flood waters. Although both streambank erosion and flooding are natural processes, the degree of the problem may be aggravated by man's activities either on the floodplain or in the watershed.

Because of the nature and complexity of problems involved in flooding and the magnitude of projects usually required to alleviate these problems, governments have traditionally adopted the attitude that some of the costs incurred are a public responsibility. This approach is particularly applicable where investment of funds results in improved management capabilities on the river or benefits to a widely dispersed population. More fundamentally, if damages result from the actions of a public resource, water, then some liability of the public sector, government, is implied. Therefore, government should contribute to cost-sharing on flood protection projects.

3. River Training

River training provides protection against the erosive action of rivers and streams that threaten life or property. River training projects consist of works to prevent or control bank erosion or bed scour, works to improve channel capacity which has been reduced by land slides or jams, etc., works to contain shifting channels, land management schemes to control development in areas subject to erosive action by rivers and streams, or any combination of the above. River training projects usually provide benefits to quite localized areas, but on a provincial scale, considerable public benefits accrue from protection of public property and the removal of hazards. Also, management of the water resource is a public concern. Government should contribute to the costs of the river training projects.

4. Water-Based Recreation

Projects which provide a new or enhanced site for public outdoor recreation opportunities consist of works to create water storage facilities at sites which have recreation capability, works to improve water quantity and/or quality conditions at existing public water-based recreation sites, land management schemes to improve water quantity and/or quality conditions at public water-based recreation facilities, the provision of public access to a water body, or any combination of the above. Water-

based recreation projects usually provide benefits to the public at large, although because of distance factors, the local population can use the facilities more often and at less cost. Clearly, government should contribute to the cost where public access is provided. However, local groups will also benefit, and should contribute through a cost-sharing arrangement.

5. Fish and Waterfowl Habitat Enhancement.

Projects which provide new or improved habitat for fish, waterfowl, and other wildlife consist of works to create water storage facilities at sites which have fish and/or waterfowl habitat capability, works to improve water quantity and/or quality conditions at existing fish and/or waterfowl habitat sites, land management schemes to improve water quantity and/or quality conditions for fish and/or waterfowl habitat enhancement, or any combination of the above. Fish and waterfowl habitat enhancement projects provide benefits to the general public but again because of distance factors, the impact is greatest locally. A cost-sharing arrangement would allow both government and local groups to contribute to costs of such projects.

6. Major Onstream Works for River Basin Management.

Projects related to water storage, irrigation head-works, water diversion, river stabilization or multi-purpose use which would benefit the province in general through river basin management are a

- provincial responsibility, and should be funded by the government.

7. Municipal Sewage Works.

Projects related to municipal sewage works are discussed in the report Municipal Sewage Treatment Assistance Program prepared by the Standards and Approvals Division, Alberta Department of the Environment.

SUGGESTED COST-SHARING ARRANGEMENTS

Ideally, any cost-sharing arrangement should be equitable, easy to interpret, easy to administer, should assist in achieving broad water management goals, and should attempt to satisfy the principle that those who benefit should pay. Willingness to pay reflects a belief that benefits will accrue from a project. Therefore, in lieu of attempting to identify beneficiaries, willingness to pay will be taken as a criterion for cost-sharing. Before any project can be submitted for cost-sharing, a local authority must have requested that a project be initiated and must be prepared to accept part or all of project costs.

There is an obvious need for this local contribution since the lack of any financial responsibility could result in wasted services and undue pressure for unjustified projects. However, where there are public benefits from a project, the requirement for excessive local contributions could result in the under-utilization of project services.

Cost-sharing arrangements based on specified percentages of project costs are preferred since this method is easy to administer and treats all local groups equally. Within this broad framework, the following cost-sharing arrangements are adopted:

1. Sources of Water Supply to Municipalities.

Based on individual negotiations, the provincial government will cost-share up to 100% of project costs, excluding land acquisition costs.

2. Flood Control and Flow Regulation Projects.

Based on the public benefit and the degree of provincial concern, flood control projects will be designated either as minor flood control works or major flood control works.

- (i) On projects designated as minor flood control works, the provincial government will cost-share 50% of project costs, excluding land acquisition costs.
- (ii) On projects designated as major flood control works, the provincial government will assume 100% of project costs, including land acquisition costs.

3. River Training Projects.

Based on the public benefit and the degree of provincial concern, flood control projects will be designated either as minor river training works or major river training works.

- (i) On projects designated as minor river training works, the provincial government will cost-share 50% of project costs, excluding land acquisition costs.
- (ii) On projects designated as major river training works, the provincial government will assume 100% of project costs, including land acquisition costs.

4. Water-Based Recreation Projects.

Based on the percentage of public land on a water body and the public accessibility, the provincial government will cost-share on the following basis:

- (i) Where there is no public land, there will be no government contribution.
- (ii) Where there is less than 25% public land plus public access, the government will cost-share up to 75% of project costs on a pro rata basis excluding land acquisition costs.
- (iii) Where there is 25% or more public land plus public access, the provincial government will be responsible for all project costs, including land acquisition.

5. Fish and Waterfowl Habitat Enhancement

Based on the degree of public accessibility, the provincial government will cost-share on the following basis:

- (i) Where projects are privately developed (although licensed by the province) there will be no government contribution.
- (ii) Where projects are publicly developed by a local authority and are accessible to the general public, the provincial government will contribute 25% of project costs, excluding land acquisition costs.
- (iii) Where projects are developed by the provincial government, all project costs, including the acquisition of land, will be borne by government.

6. Major Onstream Works for River Basin Management

Where projects are designated to be major works important to river basin management, the provincial government shall be responsible for all project costs, including the acquisition of land.

7. Municipal Sewage Works

Financial arrangements for municipal sewage works are listed in the report Municipal Sewage Treatment Assistance Program prepared by the Standards and Approvals Division, Alberta Department of the Environment.

A summary of the above cost-sharing arrangements is outlined in Table No. 3.

TABLE NO. 3
SUMMARY OF COST-SHARING ARRANGEMENTS

TYPE OF PROJECT	PERCENTAGE CONTRIBUTION BY TYPE OF COST							
	Preliminary Engineering Analysis		Detailed Engineering Analysis		Land Acquisition Costs		Capital Costs	
	Provincial Government	Local Authority	Provincial Government	Local Authority	Provincial Government	Local Authority	Provincial Government	Local Authority
Source of Water Supply to a Municipality	100%	0%	up to 100%	remainder	0%	100%	up to 100%	remainder
Flood Control and Flow Regulation								
1. Minor Works	100%	0%	50%	50%	0%	100%	50%	50%
2. Major Works	100%	0%	100%	0%	100%	0%	100%	0%
River Training								
1. Minor Works	100%	0%	50%	50%	0%	100%	50%	50%
2. Major Works	100%	0%	100%	0%	100%	0%	100%	0%
Water-Based Recreation								
1. 0% Public Land	*	*	*	*	*	*	*	*
2. Less than 25% public land	100%	0%	up to 75%	remainder	0%	100%	up to 75%	remainder
3. 25% or more public land	100%	0%	100%	0%	100%	0%	100%	0%
Fish and Waterfowl Habitat Enhancement								
1. Privately developed	*	*	*	*	*	*	*	*
2. Developed by local authority	100%	0%	25%	75%	0%	100%	25%	75%
3. Developed by provincial government	100%	0%	100%	0%	100%	0%	100%	0%
Major Onstream Works	100%	0%	100%	0%	100%	0%	100%	0%

*100% by private interests.

A local authority means:

- (a) a city, town, new town, village, municipal district or county, or
- (b) the Minister of Municipal Affairs, in the case of an improvement district or special area, or
- (c) the board of directors of an irrigation district, or
- (d) the board of trustees of a drainage district.

CONDITIONS FOR COST-SHARING

The institution of cost-sharing arrangements for water resource projects does not imply that all proposed projects will receive approval for cost-sharing. Before any project is considered for cost-sharing, the following conditions must be met:

1. The project must be initiated by a local authority.
2. The nature of the project must be such that it qualifies under a cost-sharing arrangement as defined herein.
3. A need for such a project can be established.
4. The project is in the public interest. Projects are deemed to be in the public interest when they:
 - (a) provide benefits to the general populace, or
 - (b) protect human life, or
 - (c) protect public investment.
5. Detailed project planning and consideration of all aspects of water resource management must precede any implementation.
6. The local authority initiating the project will accept responsibility for all operation and maintenance costs.
7. The condition which will take precedence over all others is the budgetary priority for water management established by government.

CONCLUSIONS

1. Clearly defined cost-sharing arrangements for water resource projects will result in consistent treatment of local authorities involved in the development of water management projects.
2. Those project costs to be included in cost-sharing arrangements should be defined.
3. No single arrangement for all types of projects is equitable because benefits to the general public vary with different types of projects.
4. Cost-sharing arrangements based on specified percentage contributions are preferred, since these are easy to administer and provide a consistent approach to cost-sharing.
5. It is in the public interest to implement cost-sharing arrangements.

RECOMMENDATIONS

1. Comprehensive project planning and consideration of all aspects of water management should precede the implementation of any cost-shared projects.
2. The cost-sharing arrangements outlined in this report should be initiated on water management projects.

APPENDIX A

OTHER SERVICES

In addition to financial assistance through cost-sharing arrangements, the Government of the Province of Alberta, through the Water Resources Division, Department of the Environment extends a number of technical services to the public which apply to problem solution, management, and administration of the water resource. The following paragraphs define these services and indicate those which are extended entirely at government cost and those for which some financial contribution is made by the applicant.

1. General Inspection Services.

Requests are received from individuals, local groups, local authorities, and private enterprises concerning any matter related to the water resource: its use, control, development, or administration. Response to these requests can include action extending from verbal or written advice to field inspections, surveys, and the preparation of reports containing technical information, suggestions, and recommendations.

Since these services are extended province-wide, collectively they represent benefit to all interests of the general public. Accordingly, such services are extended at public expense with the exception that costs are recovered where investigations for private enterprise entail significant expenditures.

Specifically, general inspection services are extended in the following areas, but are not necessarily confined to these:

- (i) Flood control - river and stream flood channels; agricultural land; cities, towns, and villages; private holdings; industrial developments.
- (ii) Erosion control - river or stream channel erosion; land surface erosion.
- (iii) Watershed management - proposals for subdivision of land adjacent to water bodies; general groundwater availability for proposed subdivisions; environmental impact arising from private and industrial developments.
- (iv) Groundwater contamination - investigation of existing or potential contamination problems.
- (v) Soil drainage - seepage and/or alkali conditions requiring the design of remedial measures for alleviation of salted and waterlogged land problems.
- (vi) On farm water management - technical advice is provided on the most efficient and effective methods of utilization and conservation of water on farm lands.

2. Dissemination of Data.

As part of an ongoing requirement for carrying out the responsibilities of the Water Resources Division, basic data is continuously being obtained and analyzed on all aspects of water. This data, available to the public upon request, includes information on streamflow, flood frequencies and magnitudes, availability of groundwater, precipitation, lake levels, water

quality, and storage potentials to name but a few. The information is made available at public expense.

3. Flow Forecasting Service.

The Water Resources Division maintains a flow forecasting service designed to inform the public of unusual occurrences on the province's rivers, streams, or lakes. Excessive rainfall or rapid snow melt may result in potentially dangerous high water conditions. Continuous monitoring of precipitation levels and stream discharge plus analysis of river or lake characteristics allows flow forecasts to be developed. Knowledge of probable flood levels allows private landowners, communities, and government agencies the opportunity to undertake appropriate action to reduce the damages occurring from high water conditions. This service, available province-wide, is provided at public expense.

4. Special Services.

Certain special services are available to the public for which, because of their nature or costs, certain charges are levied. Special services include:

- (i) Rural water development - in association with an ongoing inventory of groundwater availability, groundwater test holes can be drilled if requested. Test holes cannot be used as wells, but supply information on the quantity and quality of groundwater available. This service is available on request. However, the following fees are levied:

application fee (100 foot hole)	\$ 50
101 - 300 foot hole @ \$.50/ft.	\$100
301 - 500 foot hole @ \$.25/ft.	\$ 50
compressor test and water sample	\$ 25

- (ii) Dugout testing - test drilling is completed to establish the water retention capacity of the soil. A fee of \$15 is charged.
- (iii) Land fill site investigations - the potential of land fill sites to contaminate groundwater supplies is investigated. A minimum fee of \$50 is levied plus \$.50 per foot in excess of 100 feet of drilling plus the cost of any materials installed for observation purposes.
- (iv) Emergency water supplies - if the source of a municipal water supply unexpectedly fails, the division provides pumping equipment on a short term basis to alleviate the water shortage. Charges are levied as follows:

rental of pipe @ \$.10 per foot
labour & supervision @ \$3.25 per hour
hauling pipe @ \$11.20 per hour

5. Services Related to Specific Programs.

In addition to services available to the public at large, services are available on a more restricted basis to specific programs administered by the division. Examples of services related to specific programs include:

- (i) Engineering services to the Irrigation Capital Works program which is designed to maintain existing irrigation districts in a workable condition.
- (ii) Land disposal of sewage effluent. This is an experimental research program designed to test the feasibility of disposing of sewage effluent by irrigation. Technical advice and experimental testing can be made available to interested communities.

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